Occupational and Environmental Uses of Genomics

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Uses	*Types of Genetic Information*	
	Inherited genetic factors	*Acquired genetic effects*
Research		
Practice		
Regulation/ Litigation		

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Inherent Genetic Factors - Research

- Surveillance
- Mechanistic insight
- Gene-environment interaction
- Determination of predictive value

Issues

- Safeguarding rights of participants
- Interpreting and communication results

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Inherent Genetic Factor - Practice

- Use in diagnosis
- Genetic screening & testing – job actions, clinical practice
- Implementation for preventive services
- Targeting high-risk groups

Issues

- No test validated for job placement screening
- Voluntary job screening – slippery slope

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Inherited Genetic Factors – Litigation and Regulation

- Worker's Compensation
- Risk Assessment
- Tort Litigation
- Standard Setting

Issues

- Most genetic tests not validated for worker's compensation
- Societal implications of genetic "hypersusceptibles"

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Acquired Genetic Effects - Research

- Effects of exposure (cytogenetics, “omics”)
- Linkage to disease
- Early warning
- Mechanistic insight

Issues

- Standardization of platforms, experiments
- Interpretation – distinguish homeostatic from pathologic
- Systems approach

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Acquired Genetic Effects – Practice

- Genetic monitoring
- Intervention evaluation
- Risk profiling

Issues

- Premature use
- Individual risk interpretation and communication

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Acquired Genetic Effects

- Risk assessment/management
- Pre-market Testing
- Workers' Compensation
- Tort Litigation
- Standard Setting

Issues

- Lack of validation
- Interpretation
- Protocol for use by regulatory agencies

Genetics is at the core of research on cancers, coronary heart disease, high blood pressure, neurologic and psychiatric disorders, and a host of common clinical conditions, many influenced by environmental exposures.

Omenn, 2000

Today we are at a critical junction when new tools and opportunities for substantial scientific achievement intersect with our growing understanding of cellular and molecular mechanism by which environmental exposures exert their effect.

Omenn, 2000

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